

CLAIMS

What is claimed is:

1. An electrostatic chuck to chuck an object using electrostatic force, the electrostatic chuck comprising:
 - a main body to support the object;
 - a guide ring supported by the main body and encircling the object;
 - a dielectric material layer interposed between the guide ring and the main body;
 - a media gas supplier to supply a media gas to the guide ring; and
 - a power supplier to supply power to the main body.
2. The electrostatic chuck according to claim 1, wherein the main body is made with conductive materials such that the power supplied to the main body is transmitted to the dielectric material layer and the guide ring.
3. The electrostatic chuck according to claim 1, further comprising an electrode interposed between the dielectric material layer and the main body, wherein the power supplier supplies power to the electrode.
4. The electrostatic chuck according to claim 3, further comprising a second dielectric material layer interposed between the electrode and the main body.
5. The electrostatic chuck according to claim 1, further comprising a media gas supply hole for the guide ring provided in the main body, wherein the media gas supplied from the media gas supplier flows therethrough and contacts the guide ring.
6. The electrostatic chuck according to claim 1, wherein the object is a planar object.
7. The electrostatic chuck according to claim 1, wherein the object is a plate type wafer.

8. The electrostatic chuck according to claim 1, further comprising a plurality of media gas supply holes provided in the main body, wherein the media gas flows therethrough.

9. The electrostatic chuck according to claim 8, wherein the plurality of media gas supply holes penetrate the main body and the dielectric material layer and the media gas flowing therethrough contacts the guide ring and the object.

10. The electrostatic chuck according to claim 9, wherein the media gas contacting the guide ring cools the guide ring and the media gas contacting the object cools the object, whereby the guide ring and the object are maintained at a similar temperature such that an outside edge and a middle part of the object are maintained at a similar temperature.

11. The electrostatic chuck according to claim 8, wherein the plurality of media gas supply holes comprise a first group of media gas supply holes and a second group of media gas supply holes not connected to the first group of media gas supply holes, wherein the first group of media gas supply holes contains a first media gas that contacts the guide ring, and the second group of media gas supply holes contains a second media gas that contacts the object, wherein the first media gas and the second media gas are different.

12. The electrostatic chuck according to claim 1, wherein the main body further comprises:

a coolant supplier to supply coolant; and

a plurality of coolant passages provided in the main body, wherein the coolant supplied by the coolant supplier flows through the plurality of coolant passages, thereby cooling the main body.

13. The electrostatic chuck according to claim 1, further comprising an RF generator, to supply RF power to the main body.

14. The electrostatic chuck according to claim 13, wherein the RF power supplied to the main body is transmitted to a reaction gas for a semiconductor manufacturing process.

15. The electrostatic chuck according to claim 1, wherein the dielectric material layer is interposed by layering on the main body.

16. The electrostatic chuck according to claim 1, wherein the dielectric material layer is interposed by bonding on the main body.

17. The electrostatic chuck according to claim 1, wherein the dielectric material layer is made with a highly dielectric material.

18. The electrostatic chuck according to claim 1, wherein the dielectric material layer is made with oxide, nitride, or ceramic.

19. The electrostatic chuck according to claim 1, wherein the dielectric material layer is made of a surface-processed material.

20. The electrostatic chuck according to claim 1, wherein the media gas is helium.

21. The electrostatic chuck according to claim 1, wherein the media gas is argon.

22. An electrostatic chuck to chuck an object using electrostatic force, the electrostatic chuck comprising:

- a main body to support the object;
- a guide ring supported by the main body and encircling the object;
- a dielectric material layer interposed between the guide ring and the main body; and
- a power supplier to supply power to the main body.

23. The electrostatic chuck according to claim 22, further comprising an electrode interposed between the dielectric material layer and the main body, wherein the power supplier supplies power to the electrode.

24. An electrostatic chuck to chuck an object using electrostatic force, the electrostatic chuck comprising:

- a main body to support the object;

a guide ring supported by the main body and encircling the object;
a media gas supplier to supply a media gas to the guide ring; and
a power supplier to supply power to the main body.

25. The electrostatic chuck according to claim 24, further comprising a plurality of media gas supply holes provided in the main body, wherein the media gas flows therethrough.

26. The electrostatic chuck according to claim 25, wherein the media gas contacting the guide ring cools the guide ring and the media gas contacting the object cools the object, whereby the guide ring and the object are maintained at a similar temperature such that an outside edge and a middle part of the object are maintained at a similar temperature.

27. The electrostatic chuck according to claim 25, wherein the plurality of media gas supply holes comprise a first group of media gas supply holes and a second group of media gas supply holes not connected to the first group of media gas supply holes, wherein the first group of media gas supply holes contains a first media gas that contacts the guide ring, and the second group of media gas supply holes contains a second media gas that contacts the object, wherein the first media gas and the second media gas are different.

28. A method of cooling a guide ring in an electrostatic chuck, the method comprising:

cooling the guide ring using a media gas supplied through a plurality of media gas supply holes provided in a main body, wherein the media gas contacts the guide ring.

29. The method of claim 28, the method further comprising cooling an object being chucked by the electrostatic chuck using the media gas supplied through the plurality of media gas supply holes provided in the main body, wherein the media gas also contacts the object.

30. The method of claim 29, wherein the guide ring and the object are maintained at similar temperatures such that an outer edge of the object and a center of the object are maintained at a similar temperature, thereby allowing for a uniform processing of the object.